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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/006,927	12/03/2001	Yong Rui	MS1-885US	9291
22801	7590	02/21/2006	EXAMINER	
LEE & HAYES PLLC 421 W RIVERSIDE AVENUE SUITE 500 SPOKANE, WA 99201			PATEL, SHEFALI D	
			ART UNIT	PAPER NUMBER
			2621	

DATE MAILED: 02/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/006,927		RUI ET AL.	
	Examiner		Art Unit	
	Shefali D. Patel		2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>11/14/05; 9/22/05; 2/3/06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendment was received on 14 November 2005.
2. Claims 31-71 are cancelled.
3. Changes to the Drawings (Figure 6) have been accepted.
4. Because claim 60 has now been cancelled, the objection made to it in the previous action has been withdrawn.
5. 35 U.S.C. 112 2nd paragraph rejection made to claims 9, 10, 19 and 26 have been overcome and withdrawn.

Information Disclosure Statement

6. The information disclosure statements (IDS), submitted on 3 February 2006, 14 November 2005 and 22 September 2005, have been considered by the examiner.

Response to Arguments

7. Applicant's arguments filed 14 November 2005 (page 14) have been fully considered but they are not persuasive.

The only arguments with regard to reference de Cuetos (from pages 12-14 under Remarks) is when applicant argue on page 14 stating, "Although de Cuetos mentions a face detector and face tracker, there is no discussion or mention in de Cuetos of how the face detection is performed... Accordingly, for at least these reasons, Applicant submits that amended claim 1 is allowable over de Cuetos."

The examiner respectfully disagrees. Claim 1 does not recite a method for detecting a face. There is nowhere in claim 1 a mention of how the face detection is performed. The claim 1 only required "automatically detecting a candidate area for a new face region in the frame." The arguments are unconvincing, as the limits in arguments are not recited in (at least) claim 1.

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Applicants' argue on page 18 with regard to reference of Wang stating "Nowhere in Wang is there any discussion or mention that that Chi-squared values are used to verify that a candidate area includes a face...if the similarity value between a color histogram and an estimated color histogram is greater than a threshold value." The examiner respectfully disagrees.

Wang discloses detecting scenes and summarizing video sequences. At col. 4 lines 9-35 Wang discloses generating a color histogram for each frame. The Wang discloses computing Chi-squared value with is compared to the predetermined threshold, verifying scene (candidate area) in the frame if the comparing value is either greater or exceeds the threshold value as disclosed at col. 4 lines 20-27.

8. Applicant's arguments with respect to claims 1-8, 11-12, 13-18, 27-230 and 5-60 (on pages 11-21 under Remarks) have been considered but are moot in view of the new ground(s) of rejection. Because of the amendment to claim 1 (changes the scope of the claim), the new grounds of rejection are submitted here within.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1-2, 5, 13, 19-22, 24-27 and 29-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Dimitrova et al. (hereinafter, "Dimitrova") (US 6,754,389).

With regard to claim 1 Dimitrova discloses a method (Figures 1-2) comprising: receiving a frame of content (10 in Figure 1); automatically detecting a candidate area in the frame that may include a face (300 in Figure 1, col. 3 line 9, lines 49-55); using one or more hierarchical verification levels to verify

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whether a human face is in the candidate area (classification system 200, col. 3 lines 10-11, the classification system can be hierarchical classification system, col. 4 lines 33-35; col. 5 lines 54-58; col. 7 lines 51-57. The classifier 200 also determines the classification depending on each segment (i.e., candidate area). For example, an anchor person, a weather newscaster, a commercial segment, etc., col. 3 line 66 to col. 4 lines 1-52); indicating that the candidate area includes the face if the one or more hierarchical verification levels verify that a human face is in the candidate area (candidate area verifies whether it is a face or text according to the set of symbols, col. 6 lines 37-65); and using a plurality of cues to track each verified face in the content from frame to frame (col. 5 lines 6-9).

With regard to **claim 2** Dimitrova discloses video content as seen at elements 10 in Figure 1 and its respective portions in the specification.

With regard to **claim 5** Dimitrova discloses repeating automatic detecting in the even tracking of a verified face is lost at col. 9 lines 3-20.

With regard to **claim 13** Dimitrova discloses the candidate area including a face comprising: recording the candidate area in a tracking list (see Face Tracking System 300).

Claim 19 is rejected the same as claim 1. Thus, arguments similar to that presented above for claim 1 is equally applicable to claim 19. Claim 19 distinguishes from claim 1 only in that it recites predicting where a contour of the face will be; encoding a smoothness constraint that penalizes roughness; applying the smoothness constraint to a plurality of possible contour locations; and selecting the contour location having the smoothest contour as a location of the face in the frame. Dimitrova teaches these features at col. 8 lines 1-65. Please note the skin tone extractor and smoother 330, the predictive technique at lines 29-30 and selecting locations at lines 43-51.

With regard to **claims 20-21** Dimitrova discloses the smoothness constraint including both contour smoothness and region smoothness at col. 8 lines 8-10 and 17-23.

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With regard to **claim 22** Dimitrova discloses Hidden Markov Model (HMM) at col. 6 lines 37-45 and at col. 7.

With regard to **claim 24** Dimitrova discloses adapting the predicting for the face in subsequent frames to account for changing color distributions (at col. 8 lines 29-30 - predictive techniques for determining each face trajectory, the trajectory including color at col. 3 lines 61-65).

With regard to **claim 25** Dimitrova discloses adapting the predicting for the face in subsequent frames based on one or more cues observed in the frame (at col. 8 lines 29-30 - predictive techniques for determining each face trajectory, the trajectory including cues at col. 3 lines 53-65).

Claim 26 is rejected the same as claim 19. Thus, arguments similar to that presented above for claim 19 is equally applicable to claim 26.

With regard to **claim 27** Dimitrova discloses tracking multiple possible locations at col. 8 lines 30-55.

With regard to **claims 29-30** Dimitrova discloses using a particle filter to concurrently track the multiple possible locations at col. 8 lines 62-65.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 3-4, 6-7, 11 and 14-18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dimitrova et al. (hereinafter, "Dimitrova") (US 6,754,389) in view of de Cuetos et al. (hereinafter, "de Cuetos") (US 6,754,373).

With regard to **claims 3 and 4** Dimitrova discloses a method as disclosed above in claim 1 and the arguments are not repeated herein, but are incorporated by reference. Dimitrova does not expressly

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disclose the frame of content comprising a frame of audio content. de Cuetos discloses both audio and video content as seen at elements 18 and 26 in Figure 1 and at col.4 lines 1-20. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Dimitrova with de Cuetos. The motivation for doing so is to have audio content rather than video as suggested by de Cuetos. Please note, in Dimitrova, the “other object tracking system” at element 500 in Figure 1. Audio can be one of the other objects that can be tracked from the video stream 10. Therefore, it would have been obvious to combine Dimitrova with de Cuetos to obtain the invention as specified in claims 3-4.

With regard to **claim 6** de Cuetos discloses receiving the frame of content comprises receiving a frame of video content from a video capture device local to a system implementing the method (as seen in Figure 1, the system of local).

With regard to **claim 7** de Cuetos discloses receiving the frame of content comprises receiving the frame of content from a computer readable medium accessible to a system implementing the method (computer system disclosed in Figure 1).

With regard to **claim 11** it would have been obvious matter of design choice to modify the de Cuetos reference by having levels in the hierarchical verifications levels to include a level to verify a ROI faster but less accuracy than the other level since applicant has not discloses that having this coarse levels solves any stated problem or is for any particular purpose and it appears that the levels defied in claim 11 would perform equally well with the levels defined as in claim 1 (as disclosed in de Cuetos).

With regard to **claim 14** de Cuetos discloses recording the candidate area in the tracking list comprising accessing a record corresponding to the candidate area and resetting a time since last verification of the candidate (see “Countdown timed out?”, element 122 in Figure 2).

With regard to **claim 15** de Cuetos discloses the one or more hierarchical verification levels include a first level and a second level, and wherein using the one or more hierarchical verification levels

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to verify whether the human face is in the candidate area comprises: checking whether, using the first level verification, the human face is verified as in the candidate area; and using the second level verification only if the checking indicates that the human face is not verified as in the candidate area by the first level verification (de Cuetos uses the classifier 32 to classify features at different level. Verifying continuously whether the person is talking or not and whether the person comes in front of a camera. See, col. 5 line 32 to col. 6 lines 1-30).

Claim 16 recites similar features as claim 15. Thus, arguments similar to that presented above for claim 15 is equally applicable to claim 16. Note that de Cuetos discloses identifying human face from the ROI mentioned above.

Claim 17 recites identical features as claim 11. Thus, arguments similar to that presented above for claim 11 is equally applicable to claim 17.

With regard to **claim 18** Both de Cuetos and Dimitrova discloses plurality of cues as color (Dimitrova, col. 3 lines 64-65), edge, motion, and audio (de Cuetos, col. 3 lines 50 to col. 4 lines 1-7).

13. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over Dimitrova et al. (hereinafter, "Dimitrova") (US 6,754,389) in view of Wang et al. (hereinafter, "Wang") (US 5,805,733).

With regard to **claim 12** Dimitrova discloses the method as disclosed above in claim 1 and the arguments are not repeated herein, but are incorporated by reference. Dimitrova does not expressly disclose generating a color histogram of the candidate area; generating an estimated color histogram of the candidate area based on previous frames; determining a similarity value between the color histogram and the estimated color histogram; and verifying that the candidate area includes a face if the similarity value is greater than a threshold value. Wang discloses this at col. 4 lines 9-35. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Wang with Dimitrova. The motivation for doing so is for computation efficiency, by reducing the search

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space, because all scenes in a group of related scenes need not appear in the window at the same time as suggested by Wang at col. 2 lines 1-15. Therefore, it would have been obvious to combine Wang with Dimitrova to obtain the invention as specified in claim 12.

14. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dimitrova et al. (hereinafter, "Dimitrova") (US 6,754,389).

With regards to claim 23, it would have been obvious matter of design choice to modify the Dimitrova reference by having Joint Probability Data Association Filter (JPDAF) since applicant has not discloses that having JPDAF solves any stated problem or is for any particular purpose and it appears that the Hidden Markov Model (HMM) would perform equally well with smoothness constraints.

15. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dimitrova et al. (hereinafter, "Dimitrova") (US 6,754,389) in view of Murakami et al. (hereinafter, "Murakami") (US 6,798,834).

With regard to claim 28 Dimitrova discloses the method as disclosed above in claim 1 and the arguments are not repeated herein, but are incorporated by reference. Dimitrova does not expressly disclose multiple hypothesis tracking technique to track the multiple locations. Murakami discloses multiple hypothesis tracking technique to track the multiple locations such as a moving person 201, motionless person 202, a desk 203, etc. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Murakami with Dimitrova. The motivation for doing so is to provide a motion prediction circuit, which can correctly perform motion prediction and improve the efficiency of coding by coding an image as suggested by Murakami at col. 3 lines 20-31. Therefore, it would have been obvious to combine Murakami with Dimitrova to obtain the invention as specified in claim 28.

16. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dimitrova et al. (hereinafter, "Dimitrova") (US 6,754,389) in view of de Cuetos et al. (hereinafter, "de Cuetos") (US 6,754,373) as applied to claims 1, 3-4, 6-7, 11 and 14-18 above, and further in view of Kellner (US 6,539,099).

With regard to **claim 8** Dimitrova (modified by, "de Cuetos") discloses a method as disclosed above in claim 1 and the arguments are not repeated herein, but are incorporated by reference. de Cuetos discloses detecting whether there is motion in the frame and, if there is motion in the frame, then performing motion-based initialization to identify one or more candidate areas (col. 3 lines 50-67); detecting whether there is audio in the frame, and if there is audio in the frame, then performing audio-based initialization to identify one or more candidate areas (col. 4 lines 1-50). Neither Dimitrova nor de Cuetos expressly disclose using, if there is neither motion nor audio in the frame, a fast face detector to identify one or more candidate areas. Kellner discloses face detector at col. 4 lines 45-52. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Kellner with Dimitrova and de Cuetos. The motivation for doing so is to allow more individuals to participate in the same video session as suggested by Kellner at col. 3 lines 1-12. Therefore, it would have been obvious to combine Kellner with Dimitrova and de Cuetos to obtain the invention as specified in claim 8.

Allowable Subject Matter

17. Claims 9-10 are allowed.

The closest prior art to Dimitrova, de Cuetos, Wang, Kellner, and Murakami are directed to the method as disclosed in an independent claim 1. However, the closest prior art fails to disclose anything about *determining whether there is motion at a plurality of pixels on a plurality of lines across the frame; generating a sum of frame differences for each possible segment of each of the plurality of lines;*

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selecting, for each of the plurality of lines, the segment having the largest sum; identifying a smoothest region of the selected segments; checking whether the smoothest region resembles a human upper body; and extracting, as the candidate area, a portion of the smoothest region that resembles a human head as disclosed in claim 9. It is for these reasons in combination with all the other elements of the claim that claim 9 would be allowable if rewritten in independent form including all of the limitation of the base claim and any intervening claims. Claim 10 is allowable for the same reason as claim 9.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shefali D. Patel whose telephone number is 571-272-7396. The examiner can normally be reached on M-F 8:00am - 5:00pm (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Shefali D Patel
Examiner
Art Unit 2621

8 February 2006

JINGGE WU
PRIMARY EXAMINER

